

Aug. 11, 1959

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2,899,288

METHOD OF FORMING AN ABRASIVE SHEET

Filed Jan. 10, 1958

FIG. 1.

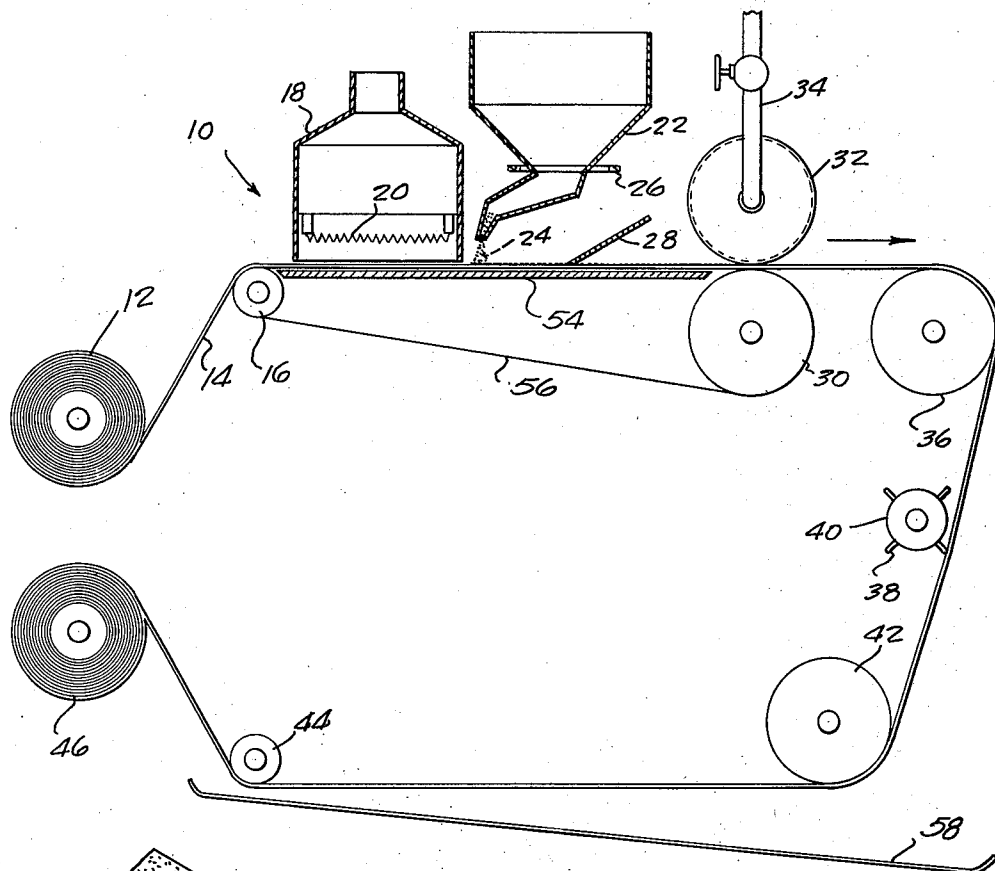


FIG. 2.

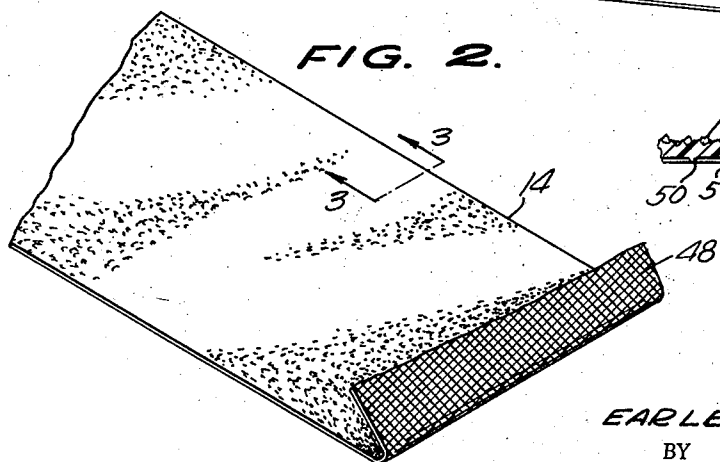
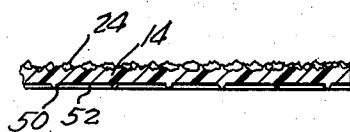


FIG. 3.

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METHOD OF FORMING AN ABRASIVE SHEET

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Application January 10, 1958, Serial No. 708,285

3 Claims. (Cl. 51—293)

The present invention relates to a method for producing an abrasive sheet.

An object of the present invention is to provide a method for producing an abrasive sheet in which the backing is fabricated wholly of plastic material.

Another object of the present invention is to provide a method of producing an abrasive sheet in which the backing is fabricated wholly of plastic material and abrasive particles are integrally bound in a face of the backing.

A further object of the present invention is to provide a method for producing an abrasive sheet which obviates the use of an adhesive.

A still further object of the present invention is to provide a method for producing an abrasive sheet which enables the abrasive particles to be embedded in a face of the plastic material backing of which the sheet is made.

Yet another object of the present invention is to provide a method for producing an abrasive sheet which is simple in execution, and commercially feasible.

These and other objects of the present invention will be fully apparent from the following description when taken in conjunction with the annexed drawing, in which:

Figure 1 is a schematic view showing the apparatus used in carrying out the method of the present invention and showing the steps of the method of the present invention for forming an abrasive sheet;

Figure 2 is an isometric view of a portion of a sheet thus formed; and

Figure 3 is a sectional view, on an enlarged scale, taken on the line 3—3 of Figure 2.

Referring to the drawing, the reference numeral 10 designates generally the apparatus employed in carrying out the method of the present invention for forming an abrasive sheet. A roll 12 of a web of cloth backing sheet fabricated of thermo-plastic material capable of being converted to a temporary softened state upon the application of heat thereto, such as polyethylene or the like is provided and is supported for free unrolling of the web of backing sheet. The web of backing sheet, designated by the reference numeral 14, is fed with one face facing upwardly through a zone heated to a temperature sufficient to convert the upper face thereof to a temporary softened state. The web 14 may be carried over a roller 16 and under the open end of a housing 18 having a coil or heating element 20 therein capable of heating the upper face of the web 14 to a temperature between 268° F. and 310° F.

A hopper 22 is supported over the web 14 and is used to apply abrasive material, as at 24, in a finely divided condition over the entire area of the upper face of the backing sheet. Preferably, the abrasive material was heated by a coil or heating element 26 to substantially the same temperature as the upper face of the backing sheet which is in the temporary softened state when it receives the finely divided abrasive material 24.

Next, the abrasive material on the upper face of the

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backing sheet is spread over the entire area of the sheet by means of a spreader 28 or other suitable means.

The next step consists in introducing the backing sheet into the nip of rollers 30 and 32 so as to simultaneously press the abrasive material 24 into the upper surface of the backing sheet and cool the backing sheet and abrasive material, the upper roller 32 being provided with a connection 34 to a source of cooling fluid. If desired, the lower roller 30 may also be filled by conventional means with a cooling fluid. The cooling of the backing sheet effects the restoration of the plastic material in the sheet one face to the original state. The web is next led over an idler roller 36 into engagement with the beaters 38 on the periphery of a beater drum 40 for shaking loose the unattached or unembedded particles of abrasive material.

The cooled sheet or web 14 is next led over another idler roller 42 and a still further idler roller 44 and is wound into the form of a roll or coil 46.

Preferably, the roller 30 has an embossed surface for creating on the back of the web 14 an embossed pattern as at 48 in Figure 2. This pattern may be of any design desired, the one illustrated having raised lines as at 50 in Figure 3 interspersed by recesses as at 52.

Preferably, a table 54 is provided over which the web 14 travels and an endless belt of suitable material such as Teflon or the like travels over the rollers 16 and 30 and over the table 54 to effect the support and movement of the web 14 as it is heated and as the material 24 is applied thereto. A tray 58 extends below the rollers 42 and 44 for collecting the unattached or loose abrasive material as it falls from the web 14. The coil 46 forms a means of recovering the web after it has been treated.

The abrasive sheet as produced by the present invention is preferably cut into sheets instead of being formed into the coil 46. The embossed backing pattern 48 provides a nonslip surface for the abrasive sheet of the present invention. Further, any suitable abrasive material may be embedded in the upper surface of the web 14 as desired.

While the above described backing is formed of polyethylene, the thermo-plastic material of the backing sheet web 14 may be polyvinyl or polystyrene or other material found suitable and of the class which may be converted to a temporary softened state by the application of heat thereto.

What is claimed is:

1. The method of forming a backing sheet having an abrasive material on one face thereof which comprises providing a cloth backing sheet fabricated of thermo-plastic material capable of being converted to a temporary softened state upon the application of heat thereto, feeding said sheet with one face facing upwardly through a zone heated to a temperature for conversion of said material to a temporary softened state to effect conversion of the material of said one face to a temporary softened state, applying abrasive material in a finely divided condition over the entire area of said sheet one face while in the temporary softened state, cooling the thus treated sheet to effect restoration of the thermo-plastic material in said sheet one face to the original state, and recovering the thus cooled sheet.

2. The method of forming a backing sheet having an abrasive material on one face thereof which comprises providing a cloth backing sheet fabricated of thermo-plastic material capable of being converted to a temporary softened state upon the application of heat thereto, feeding said sheet with one face facing upwardly through a zone heated to a temperature for conversion of said material to a temporary softened state to effect conversion of the material of said one face to a temporary softened state, applying abrasive material in a finely di-

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vided condition over the entire area of said sheet one face while in the temporary softened state, spreading the applied abrasive material evenly over the entire area of the sheet one face, cooling the thus treated sheet to effect restoration of the thermo-plastic material in said sheet one face to the original state, and recovering the thus cooled sheet.

3. The method of forming a backing sheet having an abrasive material on one face thereof which comprises providing a cloth backing sheet fabricated of thermo-plastic material capable of being converted to a temporary softened state upon the application of heat thereto, feeding said sheet with one face facing upwardly through a zone heated to a temperature for conversion of said material to a temporary softened state to effect conver-

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sion of the material of said one face to a temporary softened state, applying abrasive material in a finely divided condition and in a heated state over the entire area of said sheet one face while in the temporary softened state, simultaneously pressing and cooling the thus treated sheet to effect restoration of the thermo-plastic material in said sheet one face to the original state, and recovering the thus cooled sheet.

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